Contents

Volume 28 Number 1 **January**

Survey Article

D. Hampson — 1 **Facial injury: a review of biomechanical studies and test procedures for facial injury assessment**

R. H. Sanders, J. M. Cappaert and R. K. Devlin — 9 **Wave characteristics of butterfly swimming**

J. Peacock, S. Hankins, T. Jones and R. Lutz — 17 **Flow instabilities induced by coronary artery stents: assessment with an *in vitro* pulse duplicator**

T. R. Katona, N. H. Paydar, H. U. Akay and W. E. Roberts — 27 **Stress analysis of bone modeling response to rat molar orthodontics**

C. H. Turner, T. Yoshikawa, M. R. Forwood, T. C. Sun and D. B. Burr — 39 **High frequency components of bone strain in dogs measured during various activities**

S. Usha and A. R. Rao — 45 **Peristaltic transport of a biofluid in a pipe of elliptic cross section**

D. S. McNally and R. G. C. Arridge — 53 **An analytical model of intervertebral disc mechanics**

B. van Rietbergen, H. Weinans, R. Huiskes and A. Odgaard — 69 **A new method to determine trabecular bone elastic properties and loading using micromechanical finite-element models**

C. J. Zuurbier, J. W. Heslinga, M. B. E. Lee-de Groot and W. J. Van der Laarse — 83 **Mean sarcomere length–force relationship of rat muscle fibre bundles**

D. Popovic, M. N. Oguztöreli, and R. B. Stein — 89 **Optimal control for an above-knee prosthesis with two degrees of freedom**

Technical Notes

J. P. Holden, E. S. Grood and J. F. Cummings — 99 **Factors affecting sensitivity of a transducer for measuring anterior cruciate ligament force**

C. Wei and R. K. Jensen — 103 **The application of segment axial density profiles to a human body inertia model**

T. M. Lundin, M. D. Grabiner and D. W. Jahnigen — 109 — **On the assumption of bilateral lower extremity joint moment symmetry during the sit-to-stand task**

M. A. Lafortune, M. J. Lake and E. Hennig — 113 — **Transfer function between tibial acceleration and ground reaction force**

J. J. Crisco, K. Hentel, S. W. Wolfe and J. S. Duncan — 119 — **Two-dimensional rigid-body kinematics using image contour registration**

I — **Instructions to Contributors**

Volume 28 Number 2 — **February**

M. A. M. Berger, G. de Groot and A. P. Hollander — 125 — **Hydrodynamic drag and lift forces on human hand/arm models**

D. P. Fyhrie and M. B. Schaffler — 135 — **The adaptation of bone apparent density to applied load**

J. R. Matyas, M. G. Anton, N. G. Shrive and C. B. Frank — 147 — **Stress governs tissue phenotype at the femoral insertion of the rabbit MCL**

T. A. Maxian, T. D. Brown and S. L. Weinstein — 159 — **Chronic stress tolerance levels for human articular cartilage: two nonuniform contact models applied to long-term follow-up of CDH**

J.-B. Charbonnier, J.-C. Charmet, D. Vallet, H. Dupoisot and M. Martinsky — 167 — **Aphakia correction by synthetic intracorneal implantation: a new tool for quantitative predetermination of the optical quality**

I. A. F. Stokes and M. Gardner-Morse — 173 — **Lumbar spine maximum efforts and muscle recruitment patterns predicted by a model with multijoint muscles and joints with stiffness**

H. H. C. M. Savelberg and H. C. Schamhardt — 187 — **The influence of inhomogeneity in architecture on the modelled force–length relationship of muscles**

H. M. Toussaint, A. F. de Winter, Y. de Haas, M. P. de Looze, J. H. Van Dieen and I. Kingma — 199 — **Flexion relaxation during lifting: implications for torque production by muscle activity and tissue strain at the lumbo-sacral joint**

Technical Notes

W. Herzog, T. R. Leonard and A. Stano — 211 — **A system for studying the mechanical properties of muscles and the sensorimotor control of muscle forces during unrestrained locomotion in the cat**

A. Matsuo, H. Ozawa, K. Goda and T. Fukunaga 219 **Moment of inertia of whole body using an oscillating table in adolescent boys**

R. H. M. Goossens and C. J. Snijders 225 **Design criteria for the reduction of shear forces in beds and seats**

J. S. Jurvelin, T. Räsänen, P. Kolmonen and T. Lyyra 231 **Comparison of optical, needle probe and ultrasonic techniques for the measurement of articular cartilage thickness**

I **Instructions to Contributors**

Volume 28 Number 3 **March**

J. N. A. L. Leijnse and J. J. Kalker 237 **A two-dimensional kinematic model of the lumbrical in the human finger**

J. J. Collins 251 **The redundant nature of locomotor optimization laws**

Chung-Li Wang, Cheng-Kung Cheng, Chao-Wang Chen, Chung-Ming Lu, Yi-Shiong Hang and Tang-Kue Liu 269 **Contact areas and pressure distributions in the subtalar joint**

M. Voigt, F. Bojsen-Møller, E. B. Simonsen and P. Dyhre-Poulsen 281 **The influence of tendon Youngs modulus, dimensions and instantaneous moment arms on the efficiency of human movement**

M. Voigt, E. B. Simonsen, P. Dyhre-Poulsen and K. Klausen 293 **Mechanical and muscular factors influencing the performance in maximal vertical jumping after different prestretch loads**

T. L. Norman, D. Vashishth and D. B. Burr 309 **Fracture toughness of human bone under tension**

J. Cholewicki, S. M. McGill and R. W. Norman 321 **Comparison of muscle forces and joint load from an optimization and EMG assisted lumbar spine model: towards development of a hybrid approach**

Technical Notes

L. C. Rome 333 **A device for synchronizing biomechanical data with cine film**

P. L. Santaguida and S. M. McGill 339 **The psoas major muscle: a three-dimensional geometric study**

J. M. Hausdorff, Z. Ladin and J. Y. Wei — 347 **Footswitch system for measurement of the temporal parameters of gait**

Letters to the Editors

J. D. Bryant — 353 **Kafka, V. (1993) Letter to the Editor: On hydraulic strengthening of bones**

C. Hrysomallis — 355 **Martin, R. B. *et al.* (1994) The relationship between mass and acceleration for impacts on padded surfaces**

R. B. Martin — 355 **Response**

I **Instructions to Contributors**

Volume 28 Number 4 **April**

J.-K. Suh, Z. Li and S. L-Y. Woo — 357 **Dynamic behavior of a biphasic cartilage model under cyclic compressive loading**

C. Stone and M. L. Hull — 365 **The effect of rider weight on rider-induced loads during common cycling situations**

L. S. Chou, S. M. Song and L. F. Draganich — 377 **Predicting the kinematics and kinetics of gait based on the optimum trajectory of the swing limb**

S. Cavalcanti — 387 **Hemodynamics of an artery with mild stenosis**

M. A. Nussbaum, D. B. Chaffin and C. J. Rechtien — 401 **Muscle lines-of-action affect predicted forces in optimization-based spine muscle modeling**

M. Tissakht and A. M. Ahmed — 411 **Tensile stress–strain characteristics of the human meniscal material**

R. R. Neptune and M. L. Hull — 423 **Accuracy assessment of methods for determining hip movement in seated cycling**

Technical Notes

P. Braidotti, F. P. Branca, E. Sciubba and L. Stagni — 439 **An elastic compound tube model for a single osteon**

S. C. Cowin — 445 **On the minimization and maximization of the strain energy density in cortical bone tissue**

C. R. Jacobs, M. E. Levenston, G. S. Beaupré, J. C. Simo and D. R. Carter — 449 **Numerical instabilities in bone remodeling simulations: the advantages of a node-based finite element approach**

I. M. Katz, E. J. Shaughnessy and B. B. Cress — 461 **A technical problem in the calculation of laminar flow near irregular surfaces described by sampled geometric data**

B. Mikić and D. R. Carter — 465 **Bone strain gage data and theoretical models of functional adaptation**

S. Cheng, J. Timonen and H. Suominen — 471 **Elastic wave propagation in bone *in vivo*: methodology**

Letters to the Editor

C. W. McCutchen — 479 **Comment on 'The biphasic poro-viscoelastic behavior of articular cartilage: role of the surface zone in governing the compressive behavior'**

L. A. Setton, W. Zhu and V. C. Mow — 481 **Authors' Response**

H. Hatze — 483 **Comments on 'A video-based system for the estimation of the inertial properties of body segments'**

Z. Ladin — 485 **Author's Response**

487 **Announcements**

I **Instructions to Contributors**

Volume 28 Number 5 **May**

N. Wuelker, C. J. Wirth, W. Plitz and B. Roetman — 489 **A dynamic shoulder model: reliability testing and muscle force study**

D. A. Vorp, K. R. Rajagopal, P. J. Smolinski and H. S. Borovetz — 501 **Identification of elastic properties of homogeneous, orthotropic vascular segments in distension**

W. M. Murray, S. L. Delp and T. S. Buchanan — 513 **Variation of muscle moment arms with elbow and forearm position**

R. E. Hughes and D. B. Chaffin — 527 **The effect of strict muscle stress limits on abdominal muscle force predictions for combined torsion and extension loadings**

G. Bergmann, F. Graichen and A. Rohlmann — 535 **Is staircase walking a risk for the fixation of hip implants?**

H. Nieminen, J. Niemi, E.-P. Takala and E. Viikari-Juntura — 555 **Load-sharing patterns in the shoulder during isometric flexion tasks**

B. Duan and M. Zamir — 567 **Mechanics of wave reflections in a coronary bypass loop model: the possibility of partial flow cut-off**

D. M. O'Doherty, S. P. Butler and A. E. Goodship — 575 **Stress protection due to external fixation**

F. Schuind, W. P. Cooney, R. L. Linscheid, K. N. An and E. Y. S. Chao — 587 **Force and pressure transmission through the normal wrist. A theoretical two-dimensional study in the posteroanterior plane**

Technical Notes

T. Schumann, M. S. Redfern, J. M. Furman, A. El-Jaroudi and L. F. Chaparro — 603 **Time-frequency analysis of postural sway**

M. E. McAlarney — 609 **Use of the boundary element method for biological morphometrics**

L. Cristofolini, M. Viceconti, A. Toni and A. Giunti — 617 **Influence of thigh muscles on the axial strains in a proximal femur during early stance in gait**

M. Rostedt, H. Broman and T. Hansson — 625 **Resonant frequency of a pin–accelerometer system mounted in bone**

N. A. Sharkey, T. S. Smith and D. C. Lundmark — 631 **Freeze clamping musculo-tendinous junctions for *in vitro* simulation of joint mechanics**

Hai-Chao Han and Yuan-Cheng Fung — 637 **Longitudinal strain of canine and porcine aortas**

Letters to the Editor

W. Herzog and B. I. Prilutsky — 643 **Comments on 'Relationship between ankle muscle and joint kinetics during the stance phase of locomotion in the cat'**

E. G. Fowler and R. J. Gregor — 645 **Authors' Response**

Book Review — 647

I **Instructions to Contributors**

Volume 28 Number 6 **June**

B. Prakash and M. Singh 649 **Optimum kinetic energy dissipation to maintain blood flow in glass capillaries: an analysis based on flow field determination by axial tomographic and image velocimetry techniques**

K. G. M. Gerritsen, A. J. van den Bogert and B. M. Nigg 661 **Direct dynamics simulation of the impact phase in heel–toe running**

A. Hreljac 669 **Determinants of the gait transition speed during human locomotion: kinematic factors**

L. J. Brossollet and R. P. Vito 679 **An alternate formulation of blood vessel mechanics and the meaning of the *in vivo* property**

L. Noreau, C. L. Richards, F. Comeau and D. Tardif 689 **Biomechanical analysis of swing-through gait in paraplegic and non-disabled individuals**

R. P. Young and R. G. Marteniuk 701 **Changes in inter-joint relationships of muscle moments and powers accompanying the acquisition of a multi-articular kicking task**

M. Dalstra and R. Huiskes 715 **Load transfer across the pelvic bone**

Technical Notes

M. S. Damaser and S. L. Lehman 725 **The effect of urinary bladder shape on its mechanics during filling**

J. H. Challis 733 **A procedure for determining rigid body transformation parameters**

H. Weinans and L. Blankevoort 739 **Reconstruction of bone loading conditions from *in vivo* strain measurements**

T. J. A. Momersteeg, L. Blankevoort, R. Huiskes, J. G. M. Kooloos, J. M. G. Kauer and J. C. M. Hendriks 745 **The effect of variable relative insertion orientation of human knee bone–ligament–bone complexes on the tensile stiffness**

J. J. Eng and D. A. Winter 753 **Kinetic analysis of the lower limbs during walking: what information can be gained from a three-dimensional model?**

K. A. Bowsher and C. L. Vaughan 759 **Effect of foot-progression angle on hip joint moments during gait**

Letters to the Editor

C. H. Turner — 763 — **Is yield strain in cancellous bone isotropic?**

T. M. Keaveny, E. F. Wachtel, C. M. Ford and W. C. Hayes — 765 — **Authors' Response**

I **Instructions to Contributors**

Volume 28 Number 7 **July**

C. Högfors, D. Karlsson and B. Petersen — 767 — **Structure and internal consistency of a shoulder model**

Siping Li, A. G. Patwardhan, F. M. L. Amirouche, R. Havey and K. P. Meade — 779 — **Limitations of the standard linear solid model of intervertebral discs subject to prolonged loading and low-frequency vibration in axial compression**

G. J. Loren and R. L. Lieber — 791 — **Tendon biomechanical properties enhance human wrist muscle specialization**

A. J. van Soest, P. A. Huijing and M. Solomonow — 801 — **The effect of tendon on muscle force in dynamic isometric contractions: a simulation study**

N. Sasaki and A. Enyo — 809 — **Viscoelastic properties of bone as a function of water content**

G. Bergmann, H. Kniggendorf, F. Graichen and A. Rohlmann — 817 — **Influence of shoes and heel strike on the loading of the hip joint**

P. G. S. Trainor, K. R. McLachlan and W. D. McCall — 829 — **Modelling of forces in the human masticatory system with optimization of the angulations of the joint loads**

K. Perktold and G. Rappitsch — 845 — **Computer simulation of local blood flow and vessel mechanics in a compliant carotid artery bifurcation model**

K. Strømsøe, A. Høiseth, A. Alho and W. L. Kok — 857 — **Bending strength of the femur in relation to non-invasive bone mineral assessment**

Technical Notes

C. S. Jørgensen, F. H. Dall, S. L. Jensen and H. Gregersen — 863 — **A new combined high-frequency ultrasound-impedance planimetry measuring system for the quantification of organ wall biomechanics *in vivo***

R. E. Debski, P. J. McMahon, W. O. Thompson, S. L-Y. Woo, J. J. P. Warner and F. H. Fu — 869 — **A new dynamic testing apparatus to study glenohumeral joint motion**

R. E. Hughes, J. C. Bean and D. B. Chaffin — 875 — **Evaluating the effect of co-contraction in optimization models**

L. Chèze, B. J. Fregly and J. Dimnet — 879 — **A solidification procedure to facilitate kinematic analyses based on video system data**

S. Kitazaki and M. J. Griffin — 885 — **A data correction method for surface measurement of vibration on the human body**

I — **Instructions to Contributors**

Volume 28 Number 8 — **August**

D. A. McCubbrey, D. D. Cody, E. L. Peterson, J. L. Kuhn, M. J. Flynn and S. A. Goldstein — 891 — **Static and fatigue failure properties of thoracic and lumbar vertebral bodies and their relation to regional density**

R. G. Keanini, R. D. Roer and R. M. Dillaman — 901 — **A theoretical model of circulatory interstitial fluid flow and species transport within porous cortical bone**

D. Bluestein and S. Einav — 915 — **The effect of varying degrees of stenosis on the characteristics of turbulent pulsatile flow through heart valves**

R. A. Brandt and M. A. Pichowsky — 925 — **Conservation of energy in competitive swimming**

M. J. Moulton, L. L. Creswell, R. L. Actis, K. W. Myers, M. W. Vannier, B. A. Szabó and M. K. Pasque — 935 — **An inverse approach to determining myocardial material properties**

E. Munting and M. Verhelpen — 949 — **Fixation and effect on bone strain pattern of a stemless hip prosthesis**

J. R. Sachs and A. J. Grodzinsky — 963 — **Electromechanical spectroscopy of cartilage using a surface probe with applied mechanical displacement**

Technical Notes

J. L. Ronsky, W. Herzog, T. D. Brown, D. R. Pedersen, E. S. Grood and D. L. Butler — 977 — ***In vivo* quantification of the cat patellofemoral joint contact stresses and areas**

S. T. McCaw and P. DeVita — 985 — **Errors in alignment of center of pressure and foot coordinates affect predicted lower extremity torques**

M. A. Lafortune, E. Henning and G. A. Valiant — 989 — **Tibial shock measured with bone and skin mounted transducers**

G. K. Seidel, D. M. Marchinda, M. Dijkers and R. W. Soutas-Little — 995 — **Hip joint center location from palpable bony landmarks—a cadaver study**

G. T. Yamaguchi, D. W. Moran and J. Si — 999 — **A computationally efficient method for solving the redundant problem in biomechanics**

Xin Zhang, J. A. Ashton-Miller and C. S. Stohler — 1007 — **Three-dimensional unilateral method for the bilateral measurement of condylar movements**

1013 — **Announcements**

I — **Instructions to Contributors**

Volume 28 Number 9 — **September**

M. A. Nussbaum, D. B. Chaffin and B. J. Martin — 1015 — **A back-propagation neural network model of lumbar muscle recruitment during moderate static exertions**

Wangdo Kim and A. S. Voloshin — 1025 — **Role of plantar fascia in the load bearing capacity of the human foot**

P. C. Krause, J. S. Choi and T. A. McMahon — 1035 — **The force–velocity curve in passive whole muscle is asymmetric about zero velocity**

T. D. Mast and A. D. Pierce — 1045 — **A theory of aneurysm sounds**

Young-Jo Kim, L. J. Bonassar and A. J. Grodzinsky — 1055 — **The role of cartilage streaming potential, fluid flow and pressure in the stimulation of chondrocyte biosynthesis during dynamic compression**

K. A. Mann, D. L. Bartel, T. M. Wright and A. H. Burstein — 1067 — **Coulomb frictional interfaces in modeling cemented total hip replacements: a more realistic model**

M. Ekevad and B. Lundberg 1079 **Simulation of 'smart' pole vaulting**

E. Wallenböck, O. Lang and P. Lugner 1091 **Stress in the achilles tendon during a topple-over movement in the ankle joint**

Technical Notes

M. J. Morgan and D. F. James 1103 **Force and moment distributions among osseointegrated dental implants**

M. A. Lafortune and M. J. Lake 1111 **Human pendulum approach to simulate and quantify locomotor impact loading**

M. D. Grabiner, J. W. Feuerbach, T. M. Lundin and B. L. Davis 1115 **Visual guidance to force plates does not influence ground reaction force variability**

W. F. Bluhm, A. D. McCulloch and W. Y. W. Lew 1119 **Active force in rabbit ventricular myocytes**

D. P. Pioletti, J. H. Heegaard, R. L. Rakotomanana, P. F. Leyvraz and L. Blankevoort 1123 **Experimental and mathematical methods for representing relative surface elongation of the ACL**

K. J. Fischer, C. R. Jacobs and D. R. Carter 1127 **Computational method for determination of bone and joint loads using bone density distributions**

I. Kingma, H. M. Toussaint, D. A. C. M. Commissaris, M. J. M. Hoozemans and M. J. Ober 1137 **Optimizing the determination of the body center of mass**

1143 **Book Review**

I **Suggestions for Authors**

III **Instructions to Contributors**

Volume 28 Number 10 **October**

S. F. Levinson, M. Shinagawa and T. Sato 1145 **Sonoelastic determination of human skeletal muscle elasticity**

S. L. Delp, J. H. Kocmond and S. H. Stern 1155 **Trade offs between motion and stability in posterior substituting knee arthroplasty design**

J. M. Guccione, K. D. Costa and A. D. McCulloch 1167 **Finite element stress analysis of left ventricular mechanics in the beating dog heart**

R. Happee and F. C. T. Van der Helm — 1179 **The control of shoulder muscles during goal directed movements, an inverse dynamic analysis**

M. Hlaváček and J. Novák — 1193 **The role of synovial fluid filtration by cartilage in lubrication of synovial joints—III. Squeeze-film lubrication: axial symmetry under low loading conditions**

M. Hlaváček — 1199 **The role of synovial fluid filtration by cartilage in lubrication of synovial joints—IV. Squeeze-film lubrication: the central film thickness for normal and inflammatory synovial fluids for axial symmetry under high loading conditions**

T. Matsumoto, K. Hayashi and K. Ide — 1207 **Residual strain and local strain distributions in the rabbit atherosclerotic aorta**

Technical Notes

R. N. Hinrichs and S. P. McLean — 1219 **NLT and extrapolated DLT: 3-D cinematography alternatives for enlarging the volume of calibration**

M. Krismer, R. Bauer, J. Tschupik and P. Mayrhofer — 1225 **EBRA: a method to measure migration of acetabular components**

L. R. Johnson and J. R. Shanebrook — 1237 **Flow visualization with air and smoke in a bypass graft model under steady flow conditions**

K. R. Kaufman, K.-N. An and E. Y. S. Chao — 1243 **A comparison of intersegmental joint dynamics to isokinetic dynamometer measurements**

G. Wu and P. R. Cavanagh — 1257 **ISB recommendations for standardization in the reporting of kinematic data**

1263 **Announcement**

I **Instructions to Contributors**

Volume 28 Number 11 **November**

ESB Research Award 1994

J. Heegaard, P. F. Leyvraz, A. Curnier, L. Rakotomanana and R. Huiskes — 1265 **The biomechanics of the human patella during passive knee flexion**

ESB Research Award 1994

S. C. Cowin, S. Weinbaum and Yu Zeng — 1281 — **A case for bone canaliculi as the anatomical site of strain generated potentials**

P. Aerts, R. F. Ker, D. De Clercq, D. W. Ilsley and R. McN. Alexander — 1299 — **The mechanical properties of the human heel pad: a paradox resolved**

K. P. Granata and W. S. Marras — 1309 — **An EMG-assisted model of trunk loading during free-dynamic lifting**

J. J. McInerney, E. F. Kim, M. D. Herr and G. L. Copenhaver — 1319 — **Epicardial surface dynamics in the closed-chest normal canine**

R. S. Salzar, M. J. Thubrikar and R. T. Eppink — 1333 — **Pressure-induced mechanical stress in the carotid artery bifurcation: a possible correlation to atherosclerosis**

G. A. Ateshian and Huiqun Wang — 1341 — **A theoretical solution for the frictionless rolling contact of cylindrical biphasic articular cartilage layers**

J. J. Broz, S. J. Simske and A. R. Greenberg — 1357 — **Material and compositional properties of selectively demineralized cortical bone**

B. Koopman, H. J. Grootenboer and H. J. de Jongh — 1369 — **An inverse dynamics model for the analysis, reconstruction and prediction of bipedal walking**

L. E. Claes, H.-J. Wilke and H. Kiefer — 1377 — **Osteonal structure better predicts tensile strength of healing bone than volume fraction**

Technical Notes

S. A. Kautz and M. L. Hull — 1391 — **Dynamic optimization analysis for equipment setup problems in endurance cycling**

M. Lee, D. W. Kelly and G. P. Steven — 1403 — **A model of spine, ribcage and pelvic responses to a specific lumbar manipulative force in relaxed subjects**

Letters to the Editor

R. Lakes — 1409 — **On the torsional properties of single osteons**

A. Ascenzi — 1410 — **Author's Response**

I **Instructions to Contributors**

CELL MECHANICS

C. Neidlinger-Wilke, I. Stalla, I. Claes, R. Brand, I. Hoellen, S. Rübenacker, M. Arand and L. Kinzl — 1411 — **Human osteoblasts from younger normal and osteoporotic donors show differences in proliferation and $T_{GF\beta}$-release in response to cyclic strain**

C. M. Stanford, J. W. Stevens and R. A. Brand — 1419 — **Cellular deformation reversibly depresses RT-PCR detectable levels of bone-related mRNA**

Chingju Lin, P. Lamoureux, R. E. Buxbaum and S. R. Heidemann — 1429 — **Osmotic dilution stimulates axonal outgrowth by making axons more sensitive to tension**

B. C. Berk, M. A. Corson, T. E. Peterson and H. Tseng — 1439 — **Protein kinases as mediators of fluid shear stress stimulated signal transduction in endothelial cells: a hypothesis for calcium-dependent and calcium-independent events activated by flow**

J. Y.-J. Shyy, Yi-Shan Li, Ming-Chao Lin, W. Chen, S. Yuan, S. Usami and Shu Chien — 1451 — **Multiple *cis*-elements mediate shear stress-induced gene expression**

W. F. Pritchard, P. F. Davies, Z. Derafshi, D. C. Polacek, R. Tsao, R. O. Dull, S. A. Jones and D. P. Giddens — 1459 — **Effects of wall shear stress and fluid recirculation on the localization of circulating monocytes in a three-dimensional flow model**

D. E. Ingber, D. Prusty, Zhengqi Sun, H. Betensky and Ning Wang — 1471 — **Cell shape, cytoskeletal mechanics, and cell cycle control in angiogenesis**

Wei Du, I. Mills and B. E. Sumpio — 1485 — **Cyclic strain causes heterogeneous induction of transcription factors, AP-1, CRE binding protein and NF-kB in endothelial cells: species and vascular bed diversity**

J. Roelofsen, J. Klein-Nulend and E. H. Burger — 1493 — **Mechanical stimulation by intermittent hydrostatic compression promotes bone-specific gene expression *in vitro***

A. J. Banes, M. Tsuzaki, Peiqi Hu, B. Brigman, T. Brown, L. Almekinders, W. T. Lawrence and T. Fischer — 1505 — **PDGF-BB, IGF-I and mechanical load stimulate DNA synthesis in avian tendon fibroblasts *in vitro***

A. M. Malek and S. Izumo — 1515 — **Control of endothelial cell gene expression by flow**

F. Guilak — 1529 **Compression-induced changes in the shape and volume of the chondrocyte nucleus**

Huicong Wang, W. Ip, R. Boissy and E. S. Grood — 1543 **Cell orientation response to cyclically deformed substrates: experimental validation of a cell model**

P. F. Davies, T. Mundel and K. A. Barbee — 1553 **A mechanism for heterogeneous endothelial responses to flow *in vivo* and *in vitro***

N. M. Bachrach, W. B. Valhmu, E. Stazzone, A. Ratcliffe, W. M. Lai and V. C. Mow — 1561 **Changes in proteoglycan synthesis of chondrocytes in articular cartilage are associated with the time-dependent changes in their mechanical environment**

1571 **Book Reviews**

I **Instructions to Contributors**

Keyword Index

Above – knee prosthesis, 89
Acceleration, 989
Accelerometry, 625
Achilles tendon, 1091
ACL, 1123
Actin, 1493
Actin microfilament, 1529
Activation time, 83
Adolescence, 219
Alkaline phosphatase, 1493
Analytic model, 53
Aneurysm, 1045
Anisotropy, 411
Antagonist, 875
Anterior cruciate ligament, 99, 745
Aorta, 637, 1207
Artery, 1333
Articular cartilage, 231, 1529, 1561
Atherosclerosis, 1207, 1333, 1459, 1515
Atomic force microscopy, 1553
Axial tomography, 649
Axonal elongation, 1429

Balance, 1137
Beds and seats, 225
Bending strength, 857
Bifurcation, 845, 1333
Biofluid transport, 45
Biomaterials, 167
Biomechanical model, 173
Biomechanics, 1, 45, 159, 225, 231, 679, 791, 857, 1079, 1137, 1377
Biphasic, 1561
Biphasic models, 357
Bladder, 715
Blood flow, 649, 845, 915, 1237
Blood vessels, 679
Body center of mass, 1137
Body segments, 103
Bone, 39, 69, 739, 901, 989
Bone adaptation, 39, 135
Bone architecture, 1127
Bone fracture, 1
Bone fracture mechanics, 575
Bone healing, 1377
Bone *in vitro*, 1493
Bone mechanics, 439, 471, 617, 809, 1127
Bone remodeling, 135
Bone resorption, 575
Bone strain analysis, 949
Bone strength, 1377
Bone structure, 1377
Bone volume fraction, 1377
Bovine bone, 309

Calcium, 1119
Canine and porcine, 637
Canines, 1319
Cardiac contractility, 1119
Cardiovascular biomechanics, 1207
Cardiovascular mechanics, 637, 649, 845
Cardiovascular model, 1459
Cartilage, 159, 963, 1055
Cartilage mechanics, 357, 1193, 1199
Cartilage thickness, 231
Cell mechanics, 1543
Cell modeling, 1561
Cell reorientation, 1543
Center of pressure, 985
Chemotactic factors, 1459
Cinematography, 1219
Circle of Willis, 1045
cis – acting element, 1451
Co – contraction, 875
Collagen I, 1493
Collagen fibers, 53
Computational fluid dynamics, 1553
Computer simulation, 1127
Confocal microscopy, 1529
Contact area, 269
Contact pressure, 269, 977
Cornea, 167
Coronary stents, 17
Crack propagation, 309
Creep, 779
Culture, 1411
Cyclic loading, 357
Cycling, 365, 423
Cytochalasin D, 1529
Cytomechanics, 1429
Cytoskeleton, 1529

Density, 103, 135, 891
Dental implant, 1103
Dental mechanics, 829
Design, 1155
Design analysis, 949
Diagnosis, 1045
Direct linear transformation, 1219
Dislocation, 1155
DNA synthesis, 1471
Doppler effect, 1145
Drag force, 125
Dual energy X – ray absortiometry, 857
Dynamic programming, 89
Dynamics, 1079

Efficiency, 281
Elasticity, 293, 439, 471, 1145
Elongation, 1123
EMG, 199, 251, 321, 555, 1309
Endoluminal ultrasound, 863
Endothelial cell, 1439, 1485, 1553
Endothelin – 1, 1515
Endothelium, 1451
Energy conservation, 925
Enteroentology, 45
Epicardial, 1319
Ergonomics, 173, 225, 365
Extensor digitorum longus, 83
External fixation, 575

Facial injury, 1
Failure strength, 891
Fatigue, 891
Femur, 617
Fibre architecture, 187
Fibre shortening velocity, 801
Finger joint, 237
Finite element model, 69, 135, 715, 935, 1067, 1103
Finite element modeling, 935
Flow, 901
Flow visualisation, 1237
Fluid filtration, 1193, 1199
Foot, 759, 1025
Foot forces, 661
Footswitch, 347
Force generation, 187
Force – interval relation, 1119
Force – length relation, 1119
Force plates, 1115
Force – velocity curve, 1035
Fracture mechanics, 309
Fracture toughness, 309
Frequency, 9, 885
Friction, 1067

Gait, 347, 669, 689, 753, 759, 999, 1025
Gait analysis, 1115
Gastrocnemius medialis, 83
Gene expression, 1451, 1493
Gene regulation, 1451
Glycosaminoglycan synthesis, 1561
Ground reaction forces, 113, 1115
Growth, 1471
Growth factors, 1411, 1505, 1515

Hand mechanics, 237
Heart, 1319
Heart muscle, 935
Heart valves, 915
Heat loss, 925
Hemodynamics, 17, 1459
Hip, 759, 1225
Hip center, 995
Hip dislocation, 159
Hip – joint force, 535, 817, 1127
Hip motion, 423
Hip prostheses, 949
Human bone, 309
Human movement, 281
Hydrostatic pressure, 357
Hypo – osmotic, 1429

Imaging, 119, 339
Impact, 113
Impact loading, 1111
Impedance planimetry, 863
In vivo property, 679
Inertial properties, 103
Integrins, 1471
Interface, 1067
Intervertebral disc, 53, 779
Intraocular pressure, 167
Inverse dynamics, 985, 1193, 1243
Isokinetic dynamometer, 1243

Jaw, 1007
Joint, 977
Joint moments, 109, 701, 753, 759

Kicking, 701
Kinase, 1439
Kinematics, 119, 669, 333, 733, 985, 1007, 1155, 1243, 1265
Kinetics, 985, 1243
Knee, 1155, 1243, 1265
Knee mechanics, 411

Large slip contact, 1265
Lengthforce relationships, 83
Lift coefficient, 125
Lifting, 199, 1309
Lifting tasks, 173
Ligament, 745, 1123
Ligament adaptation, 147
Ligament forces, 869
Limb alignments, 985
Load, 739, 1025
Locomotion, 211, 251, 1115
Lower extremity, 109, 113, 753
Lower limb, 1111
Lumbar, 1015
Lumbar spine, 173
Lumbo – sacral joint, 199
Luminal radius, 863

Masticatory forces, 829
Material properties, 935, 963
Mathematical model, 1543
Mean sarcomere length, 83
Mechanical load, 1505
Mechanical loading, 1493
Mechanical properties, 411
Mechanics, 1055, 1079
Mechanical signal transduction, 1529
Mechanical stress, 1471, 1515
Mechanical strain, 1411
Mechanical transduction, 1561
Mechanotransduction, 1553
Medial collateral ligament, 147, 745
Meniscus, 411
Microfilaments, 1471
Microtubules, 1471
Migration, 1225
Model, 901, 1025, 1403
Modelling, 439, 767, 801, 829, 845, 1193, 1199
Moment of inertia, 219
Monocyte adhesion, 1459
Morphology, 1377
Motion analysis, 423, 869
Motion segments, 173
Motor control, 211, 791
mRNA, 1419
Muscle, 321, 339, 1015, 1035, 1309
Muscle architecture, 791
Muscle and joint forces, 767
Muscle forces, 251, 281, 365, 999, 1179
Muscle mechanics, 187, 211, 293, 555, 801
Musculoskeletal dynamics, 293, 535, 555, 617, 767, 817, 869, 1179
Musicians, 237
Myocardium, 935, 1167
Myofiber stress, 1167

Nerve trigger, 211
Neural network, 1015
Non – invasive, 1319
Nonlinear squeeze – film lubrication, 1199
Nuclear shape, 1471

Optical biomechanics, 167
Optimal tracking, 89
Optimization, 251, 321, 829, 875, 999
Orthopaedic biomechanics, 949
Oscillating table, 219
Osteoblast, 1411, 1419
Osteocalcin, 1419
Osteons, 439
Osteoporosis, 1411

Paraplegia, 689
Patella, 1265
Patellofemoral joint, 977
Pelvic landmarks, 995
Pelvis, 715
Pennation angle, 187
Pendulum, 1111
Peristalsis, 45
Phosphatase, 1439
Photography, 333
Plantar fascia, 1025
Plastic surgery, 1
Pole vault, 1079
Porcine duodenum, 863
Poroelastic model, 1055
Power, 701, 925
Prosthesis, 1103, 1155, 1225
Prosthesis failure, 1225
Protection, 575
Protein phosphorylation, 1505
Psoas, 339

Quantitative computed tomography, 857

Rat muscle fibre bundles, 83
Reaction force, 1111
Recruitment, 1015
Relaxation, 779
Resonance, 625
Resultant moment, 985
Rigid body, 733
Running, 661, 989

Shear stress, 1451, 1515, 1553
Shoe design, 817
Shoulder joint, 555, 767, 869, 1179
Signal transductase, 1439
Simulation, 661, 1079
Sit – to – stand, 109
Skeletal muscle, 1145
Skin, 989
Skin pressure, 225
Sound, 1045
Spine, 321, 779, 875, 891, 1015,1309, 1403
Spine biomechanics, 199
Spine mechanics, 625
Spine motion, 625
Sports biomechanics, 125, 365, 423, 661, 1091
Squeeze – film lubrication, 1193
Stenosis, 915
Strain, 39, 1091, 1123, 1419, 1485
Strain analysis, 617, 1207
Streaming potential, 1055
Stress, 575, 1265
Stress relaxation, 809
Stress – strain distribution, 863
Stress tolerance, 159
Substrate deformations, 1543
Subtalar joint, 269
Swimming, 9, 125, 925
Swing, 689
Systole, 1167

Telemetry, 535, 817
Temperature, 925
Tendon, 237, 293, 791
Tendon cells, 1505
Tendon elasticity, 801
Tendon mechanics, 281
Tensegrity, 1471
TGF , 1411
Tibia, 471
Tibial shock, 989, 1111
Time – varying elastance, 1167
Tissue strain, 637
Tooth, 1103
Topple – over, 1091
Total hip replacement, 1067
Trabecular, 69
Transcription factors, 1485
Transducer, 99
Transfer function, 989
Trunk, 1309, 1403
Turbulence, 17

Ultrasonic, 231
Ultrasound, 1145
Unconfined compression, 1055

Velocimetry, 649
Vertebral bodies, 891
Vertical jump, 293
Vessel graft, 1237
Vibration, 779, 885, 1045, 1145
Video, 423
Viscoelasticity, 809

Wall stress, 715, 1333
Wall motion, 1319
Wall thickness, 863
Water content, 809
Wave propagation, 471

Author Index

Actis, R. L. 935
Aerts, P. 1299
Ahmed, A. M. 411
Akay, H. U. 27
Alexander, R. McN. 1299
Alho, A. 857
Almekinders, L. 1505
Amirouche, F. M. L. 779
An, K. N. 587, 1243
Anton, M. G. 147
Arand, M. 1411
Arridge, R. G. C. 53
Ascenzi, A. 1410
Ashton-Miller, J. A. 1007
Ateshian, G. A. 1341

Bachrach, N. M. 1561
Banes, A. J. 1505
Barbee, K. A. 1553
Bartel, D. L. 1067
Bauer, R. 1225
Bean, J. C. 875
Beaupré, G. S. 449
Berger, M. A. M. 125
Bergmann, G. 535, 817
Berk, B. C. 1439
Betensky, H. 1471
Blankevoort, L. 739, 745, 1123
Bluestein, D. 915
Bluhm, W. F. 1119
Bogert, A. J. van den 661
Boissy, R. 1543
Bojsen-Møller, F. 281
Bonassar, L. J. 1055
Borovetz, H. S. 501
Bowsher, K. A. 759
Braidotti, P. 439
Branca, F. P. 439
Brand, R. 1411, 1419
Brandt, R. A. 925
Brigman, B. 1505
Broman, H. 625
Brossollet, L. J. 679
Brown, T. 1505
Brown, T. D. 159, 977
Broz, J. J. 1357
Bryant, J. D. 353
Buchanan, T. S. 513
Burger, E. H. 1493
Burr, D. B. 39, 309
Burstein, A. H. 1067
Butler, D. L. 977
Butler, S. P. 575
Buxbaum, R. E. 1429

Cappaert, J. M. 9
Carter, D. R. 449, 465, 1127
Cavalcanti, S. 387
Cavanagh, P. R. 1257
Chaffin, D. B. 401, 527, 875, 1015
Challis, J. H. 733
Chao, E. Y. S. 587, 1243
Chao-Wang Chen 269
Chaparro, L. F. 603
Charbonnier, J.-B. 167
Charmet, J.-C. 167
Chen, W. 1451
Cheng, S. 471
Cheng-Kung Cheng 269
Chèze, L. 879
Chingju Lin 1429
Choi, J. S. 1035
Cholewicki, J. 321
Chou, L. S. 377
Chung-Li Wang 269
Chung-Ming Lu 269
Claes, I. 1411
Claes, L. E. 1377
Cody, D. D. 891
Collins, J. J. 251
Comeau, F. 689
Commissaris, D. A. C. M. 1137
Cooney, W. P. 587
Copenhaver, G. L. 1319
Corson, M. A. 1439
Costa, K. D. 1167
Cowin, S. C. 445, 1281
Cress, B. B. 461
Creswell, L. L. 935
Crisco, J. J. 119
Cristofolini, L. 617
Cummings, J. F. 99
Curnier, A. 1265

Dall, F. H. 863
Dalstra, M. 715
Damaser, M. S. 725
Davies, P. F. 1459, 1553
Davis, B. L. 1115
De Clercq, D. 1299
DeVita, P. 985
Debski, R. E. 869
Delp, S. L. 513, 1155
Derafshi, Z. 1459
Devlin, R. K. 9
Dijkers, M. 995
Dillaman, R. M. 901
Dimnet, J. 879
Draganich, L. F. 377
Duan, B. 567
Dull, R. O. 1459
Duncan, J. S. 119
Dupoisot, H. 167
Dyhre-Poulsen, P. 281, 293

Einav, S. 915
Ekevad, M. 1079
El-Jaroudi, A. 603
Eng, J. J. 753
Enyo, A. 809
Eppink, R. T. 1333

Feuerbach, J. W. 1115
Fischer, K. J. 1127
Fischer, T. 1505
Flynn, M. J. 891
Ford, C. M. 765
Forwood, M. R. 39
Fowler, E. G. 645
Frank, C. B. 147
Fregly, B. J. 879
Fu, F. H. 869
Fukunaga, T. 219
Furman, J. M. 603
Fyhrie, D. P. 135

Gardner-Morse, M. 173
Gerritsen, K. G. M. 661
Giddens, D. P. 1459
Giunti, A. 617
Goda, K. 219
Goldstein, S. A. 891
Goodship, A. E. 575
Goossens, R. H. M. 225
Grabiner, M. D. 109, 1115
Graichen, F. 535, 817
Granata, K. P. 1309
Greenberg, A. R. 1357
Gregersen, H. 863
Gregor, R. J. 645
Griffin, M. J. 885
Grodzinsky, A. J. 963, 1055
Grood, E. S. 99, 977, 1543
Groot, G. de 125
Grootenboer, H. J. 1369
Guccione, J. M. 1167
Guilak, F. 1529

Haas, Y. de 199
Hai-Chao Han 637
Hampson, D. 1
Hankins, S. 17
Hansson, T. 625
Happee, R. 1179
Hatze, H. 483
Hausdorff, J. M. 347
Havey, R. 779
Hayashi, K. 1207
Hayes, W. C. 765
Heegaard, J. H. 1123
Heegaard, J. 1265
Heidemann, S. R. 1429
Hendriks, J. C. M. 745
Hennig, E. 113
Henning, E. 989
Hentel, K. 119
Herr, M. D. 1319
Herzog, W. 211, 643, 977
Heslinga, J. W. 83
Hinrichs, R. N. 1219
Hlaváček, M. 1193, 1199
Hoellen, I. 1411
Högfors, C. 767
Høiseth, A. 857
Holden, J. P. 99
Hollander, A. P. 125
Hoozemans, M. J. M. 1137
Hreljac, A. 669
Hrysomallis, C. 355
Hughes, R. E. 527, 875
Huicong Wang 1543

Huijing, P. A. 801
Huiqun Wang 1341
Huiskes, R. 69, 715, 745, 1265
Hull, M. L. 365, 423, 1391

Ide, K. 1207
Ilsley, D. W. 1299
Ingber, D. E. 1471
Ip, W. 1543
Izumo, S. 1515

Jacobs, C. R. 449, 1127
Jahnigen, D. W. 109
James, D. F. 1103
Jensen, R. K. 103
Jensen, S. L. 863
Johnson, L. R. 1237
Jones, S. A. 1459
Jones, T. 17
Jongh, H. J. de 1369
Jørgensen, C. S. 863
Jurvelin, J. S. 231

Kalker, J. J. 237
Karlsson, D. 767
Katona, T. R. 27
Katz, I. M. 461
Kauer, J. M. G. 745
Kaufman, K. R. 1243
Kautz, S. A. 1391
Keanini, R. G. 901
Keaveny, T. M. 765
Kelly, D. W. 1403
Ker, R. F. 1299
Kiefer, H. 1377
Kim, E. F. 1319
Kingma, I. 199, 1137
Kinzl, L. 1411
Kitazaki, S. 885
Klausen, K. 293
Klein-Nulend, J. 1493
Kniggendorf, H. 817
Kocmond, J. H. 1155
Kok, W. L. 857
Kolmonen, P. 231
Kooloos, J. G. M. 745
Koopman, B. 1369
Krause, P. C. 1035
Krismer, M. 1225
Kuhn, J. L. 891

Ladin, Z. 347, 485
Lafortune, M. A. 113, 989, 1111
Lai, W. M. 1561
Lake, M. J. 113, 1111
Lakes, R. 1409
Lamoureux, P. 1429
Lang, O. 1091
Lawrence, W. T. 1505
Lee, M. 1403
Lee-de Groot, M. B. E. 83
Lehman, S. L. 725
Leijnse, J. N. A. L. 237
Leonard, T. R. 211
Levenston, M. E. 449
Levinson, S. F. 1145
Lew, W. Y. W. 1119
Leyvraz, P. F. 1123, 1265
Li, Y.-S. 1451
Li, Z. 357
Lieber, R. L. 791
Linscheid, R. L. 587
Looze, M. P. de 199
Loren, G. J. 791
Lugner, P. 1091
Lundberg, B. 1079
Lundin, T. M. 109, 1115
Lundmark, D. C. 631
Lutz, R. 17
Lyyra, T. 231

McAlarney, M. E. 609
McCall, W. D. 829
McCaw, S. T. 985
McCubbrey, D. A. 891
McCulloch, A. D. 1119, 1167
McCutchen, C. W. 479
McGill, S. M. 321, 339
McInerney, J. J. 1319
McLachlan, K. R. 829
McLean, S. P. 1219
McMahon, P. J. 869
McMahon, T. A. 1035
McNally, D. S. 53
Malek, A. M. 1515
Mann, K. A. 1067
Marchinda, D. M. 995
Marras, W. S. 1309
Marteniuk, R. G. 701
Martin, B. J. 1015
Martin, R. B. 355
Martinsky, M. 167
Mast, T. D. 1045
Matsumoto, T. 1207
Matsuo, A. 219
Matyas, J. R. 147
Maxian, T. A. 159
Mayrhofer, P. 1225
Meade, K. P. 779
Mikić, B. 465
Mills, I. 1485
Ming-Chao Lin 1451
Momersteeg, T. J. A. 745
Moran, D. W. 999
Morgan, M. J. 1103
Moulton, M. J. 935
Mow, V. C. 481, 1561
Mundel, T. 1553
Munting, E. 949
Murray, W. M. 513
Myers, K. W. 935

Neidlinger-Wilke, C. 1411
Neptune, R. R. 423
Niemi, J. 555
Nieminen, H. 555
Nigg, B. M. 661
Ning Wang 1471
Noreau, L. 689
Norman, R. W. 321
Norman, T. L. 309
Novák, J. 1193
Nussbaum, M. A. 401, 1015

O'Doherty, D. M. 575
Ober, M. J. 1137
Odgaard, A. 69
Oguztöreli,, M. N. 89
Ozawa, H. 219

Paiqi Hu 1505
Pasque, M. K. 935
Patwardhan, A. G. 779
Paydar, N. H. 27
Peacock, J. 17
Pedersen, D. R. 977
Perktold, K. 845
Petersen, B. 767
Peterson, E. L. 891
Peterson, T. E. 1439
Pichowsky, M. A. 925
Pierce, A. D. 1045
Pioletti, D. P. 1123
Plitz, W. 489
Polacek, D. C. 1459
Popovic, D. 89
Prakash, B. 649
Prilutsky, B. I. 643
Pritchard, W. F. 1459
Prusty, D. 1471

Rajagopal, K. R. 501
Rakotomanana, L. 1265
Rakotomanana, R. L. 1123
Rao, A. R. 45
Rappitsch, G. 845
Räsänen, T. 231
Ratcliffe, A. 1561
Rechtien, C. J. 401
Redfern, M. S. 603
Richards, C. L. 689
Rietbergen, B. van 69
Roberts, W. E. 27
Roelofsen, J. 1493
Roer, R. D. 901
Roetman, B. 489
Rohlmann, A. 535, 817
Rome, L. C. 333
Ronsky, J. L. 977
Rostedt, M. 625
Rübenacker, S. 1411

Sachs, J. R. 963
Salzar, R. S. 1333
Sanders, R. H. 9
Santaguida, P. L. 339
Sasaki, N. 809
Sato, T. 1145
Savelberg, H. H. C. M. 187
Schaffler, M. B. 135
Schamhardt, H. C. 187
Schuind, F. 587
Schumann, T. 603
Sciubba, E. 439
Seidel, G. K. 995
Setton, L. A. 481
Shanebrook, J. R. 1237
Sharkey, N. A. 631
Shaughnessy, E. J. 461
Shinagawa, M. 1145
Shrive, N. G. 147
Shu Chien 1451
Shyy, J. Y.-J. 1451
Si, J. 999
Simo, J. C. 449
Simonsen, E. B. 281, 293
Simske, S. J. 1357
Singh, M. 649
Siping Li 779
Smith, T. S. 631
Smolinski, P. J. 501
Snijders, C. J. 225
van Soest, A. J. 801
Solomonow, M. 801
Song, S. M. 377
Soutas-Little, R. W. 995
Stagni, L. 439
Stalla, I. 1411

Stanford, C. M. 1419
Stano, A. 211
Stazzone, E. 1561
Stein, R. B. 89
Stern, S. H. 1155
Steven, G. P. 1403
Stevens, J. W. 1419
Stohler, C. S. 1007
Stokes, I. A. F. 173
Stone, C. 365
Strømsøe, K. 857
Suh, J.-K. 357
Sumpio, B. E. 1485
Sun, T. C. 39
Suominen, H. 471
Szabó, B. A. 935

Takala, E.-P. 555
Tang-Kue Liu 269
Tardif, D. 689
Thompson, W. O. 869
Thubrikar, M. J. 1333
Timonen, J. 471
Tissakht, M. 411
Toni, A. 617
Toussaint, H. M. 199, 1137
Trainor, P. G. S. 829
Tsao, R. 1459
Tschupik, J. 1225
Tseng, H. 1439
Tsuzaki, M. 1505
Turner, C. H. 39, 763

Usami, S. 1451
Usha, S. 45

Valhmu, W. B. 1561
Valiant, G. A. 989
Vallet, D. 167
Van Dieen, J. H. 199
Van der Helm, F. C. T. 1179
Van der Laarse, W. J. 83
Vannier, M. W. 935
Vashishth, D. 309
Vaughan, C. L. 759
Verhelpen, M. 949
Viceconti, M. 617
Viikari-Juntura, E. 555
Vito, R. P. 679
Voigt, M. 281, 293
Voloshin, A. S. 1025
Vorp, D. A. 501

Wachtel, E. F. 765
Wai Du 1485
Wallenböck, E. 1091
Wangdo Kim 1025
Warner, J. J. P. 869
Wei, C. 103
Wei, J. Y. 347
Weinans, H. 69, 739
Weinbaum, S. 1281
Weinstein, S. L. 159
Wilke, H.-J. 1377
Winter, A. F. de 199
Winter, D. A. 753
Wirth, C. J. 489
Wolfe, S. W. 119
Woo, S. L.-Y. 357, 869
Wright, T. M. 1067
Wu, G. 1257
Wuelker, N. 489

Xin Zhang 1007

Yamaguchi, G. T. 999
Yi-Shiong Hang 269
Yoshikawa, T. 39
Young, R. P. 701
Young-Jo Kim 1055
Yu Zeng 1281
Yuan, S. 1451
Yuan-Cheng Fung 637

Zamir, M. 567
Zhangqi Sun 1471
Zhu, W. 481
Zuurbier, C. J. 83

Printed and bound in Great Britain by BPC Wheatons Ltd, Exeter